

INFORMATION SHEET

ORDER NO. R5-2009-_____
NORCAL WASTE SYSTEM OSTROM ROAD LANDFILL, INCORPORATED
OSTROM ROAD LANDFILL
YUBA COUNTY

Background

The Norcal Waste System Ostrom Road Landfill is a Class II municipal solid waste (MSW) landfill facility located about 14 miles southeast of the City of Marysville in Yuba County. The landfill has been in operation since 1995 serving the incorporated and unincorporated areas of Butte, Colusa, Nevada, Placer, Sutter and Yuba Counties. The facility accepts nonhazardous and designated waste, including MSW to Class II waste management units at the landfill. These wastes include dewatered sewage sludge, industrial sludges, contaminated soil, dredge debris, slab/construction/demolition debris, treated wood, commercial/industrial wastes, and other non-hazardous or designated wastes.

Existing Facilities and Expansion Area

The facility is currently permitted to develop and operate two separate Class II waste disposal modules (Modules 1 and 2) with a total footprint of 221 acres. Module 1 is comprised of Cells 1 through 5 located on the eastern half of the site. Module 2 is comprised of Cells 6 through 9 located on the western half of the site. Currently only Cells 1 through 3 have been developed. These WDRs allow construction and operation of a biosolids management facility (BMF) which includes up to two Class II surface impoundments for dewatered sewage sludge storage and a Class II land treatment unit (LTU) within the permitted facility footprint.

Alternative Daily Cover

The Discharger uses various non-hazardous and designated wastes accepted at the landfill as alternative daily cover (ADC) on landfill modules, including construction and demolition (C&D) debris (which includes processed C&D fines and unders), green waste, sludge, contaminated soils, shredded tires, and plastic tarps. These WDRs include a discharge specification requiring that, for each type of waste, the Discharger must first demonstrate that it does not pose a threat to water quality and meets the requirements for use as ADC under Title 27 CCR Section 20705.

Soil Manufacturing

It is estimated that there is a minor deficit in the amount of soil needed for future module construction activities and operations and the available onsite supply from the various borrow sources. The Discharger is expected to increase the use of ADC material in order to achieve an overall soil balance at the site. The Discharger plans to make up the difference by importing soil and ADC, and from soil manufacturing operations. Soil manufacturing operations involve the mixing of borrow soil and dried sewage sludge (sludge), so as to create a soil-type product suitable for the operations layer material.

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Soil manufacturing operations will be conducted during the dry season within the LTU area. If used as ADC, the sludge will be air-dried as necessary until it meets applicable regulatory requirements and can be handled and used effectively as ADC. Once adequately air-dried, the sludge will be transported to the working face and used as ADC, or temporarily stockpiled on a lined landfill unit for future use. If used to manufacture an operations layer, the sludge will be admixed with soil at a ratio of at least 1 part soil to 4 parts dried sludge by volume (1:4).

Liner Performance Demonstration

The Discharger submitted a *Liner Performance Demonstration Report Future Class II Liner Systems, Ostrom Road Landfill* dated 1 October 2002. The proposed containment system for the floor of all future Class II landfill cells consists of the following components from top to bottom:

- Operations layer (12-inch minimum thickness);
- 8-oz. geotextile filter layer;
- LCRS gravel layer (12-inch minimum thickness);
- Primary 60-mil HDPE geomembrane;
- 2.5-foot thick CCL with a permeability of 1×10^{-7} cm/s or less;
- Leak detection geocomposite;
- Secondary 60-mil HDPE geomembrane liner; and
- Compacted subgrade comprised of soils classified as CL, CH, or SC per the Unified Soil Classification System (USCS)

The containment system for the side slope areas of all future Class II landfill cells is as follows (from top to bottom):

- Operations layer (12-inch minimum thickness);
- 8-oz geocomposite filter/geonet;
- 60-mil textured HDPE geomembrane;
- Minimum 24-inches of low permeability compacted soil liner;

The Discharger will provide comprehensive construction quality control during the liner system construction, complete an electrical leak location survey to verify the integrity of the primary liner system, and install LFG collection pipes within the LCRS to control LFG in the future, if necessary.

The liner demonstration report compared efficiencies and leakage potential of six different liner system designs. A total leakage potential of 0.8 gallons/acre/day was calculated throughout the life of the landfill (operations and 30-year post-closure period) based on a hypothetical 15-acre cell. In addition, a cost-benefit analysis was performed which showed that additional liner components would cost significantly more without significantly reducing the leakage potential. As such, the demonstration concluded that a more stringent liner system is not warranted since the proposed system will meet the performance requirements of Title 27 CCR.

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Closure

The Discharger submitted a May 2002 Joint Technical Document that included a preliminary closure and post-closure maintenance plan (PCPCMP) for the facility. Under the PCPCMP, the final cover will be constructed over the waste as part of the closure activities. The maximum height for the closed facility, including final cover, is 365 feet mean sea level (MSL), which corresponds to a height of 255 feet above grade (using a reference ground elevation of 110 ft MSL). The final cover side slopes will have a maximum slope of 3:1 (horizontal-to-vertical), with 20-foot wide benches at intervals not exceeding 50 feet vertically. The crest will have a minimum slope of five percent to ensure adequate drainage and control erosion.

The Discharger proposes an engineered alternative final cover design as follows:

For the top deck areas of the landfill consisting of (from top to bottom):

- A one-foot thick vegetative soil layer;
- A 60-mil HDPE geomembrane;
- A low-permeability geosynthetic clay layer (GCL); and
- A one-foot thick foundation layer.

The side slope design includes (from top to bottom):

- A one-foot thick vegetative soil layer;
- A geocomposite drainage layer;
- A 60-mil HDPE geomembrane; and
- A one-foot thick foundation layer.

The Discharger has previously made the demonstration that the EAD will provide equal or better performance than the prescriptive standard. The Discharger showed that the geosynthetic materials proposed can tolerate substantially higher strains up to 10 to 18 percent or greater before yielding and can tolerate strains 10 times larger than its soil components. As such, a two-foot thick foundation is not necessary for geosynthetic materials and that a one-foot thick foundation layer is adequate to provide a clean, firm surface for its installation. In addition, the Discharger provided a hydraulic equivalency evaluation for the system using HDPE that showed significantly improved infiltration performance over the prescriptive cover system. The EAD was described and approved in previous WDRs Order No. R5-2003-0118.

Groundwater Monitoring

The groundwater table underlying the site is currently encountered at elevations of 42 feet above mean sea level (MSL) under the western portion of the site, at about 60 feet MSL in the central portion of the site, and about 90 feet MSL in the eastern portion of the site. As such, the general direction of groundwater flow is from east to west. Eventually the monitoring well network will consist of 14 permanent monitoring well locations. 7 interim wells located within the footprint of the landfill will provide interim monitoring points as the landfill is developed. Additional temporary

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monitoring wells will be installed downgradient of the biosolids management facility and monitored until the facility is clean closed. The Discharger uses the tolerance interval method for the statistical evaluation of groundwater monitoring data for naturally-occurring compounds.

Evaluation Monitoring and Corrective Action

VOCs and elevated concentrations of total dissolved solids (TDS), chloride and metals have been detected in Pan Lysimeter PL-1A which is directly overlain by leachate Sump 1A on the north side of Landfill Cell 1A. In September 2000, the Discharger began implementation of an Evaluation Monitoring Program (EMP) to assess the nature and extent of the release from the sump. The results of the Discharger's January 2001 Engineering Feasibility Study (EFS) show that there is a leak between the sump and the pan lysimeter. The leak may be due in part to a defect in a retrofitted boot sleeve that envelops the Pan Lysimeter PL-1A riser access pipe and/or defect(s) in the composite liner. Pan Lysimeter PL-1A is underlain by fill and by the original 2-foot thick low-permeability clay liner.

Suction Lysimeter VZ-2 is located beneath Pan Lysimeter PL-1A. Data collected from Suction Lysimeter VZ-2 reveals a statistically significant upward trend for chloride. Chloride has been detected at a maximum concentration of 52 mg/L, which exceeds the concentration limit of 4.1 mg/l. In response, Piezometer PZ-13 was installed in June 2002 adjacent to the riser pipe for Pan Lysimeter PL-1A to monitor for potential leachate leakage from Sump 1A into the unsaturated zone and shallow ephemeral perched groundwater.

Piezometer PZ-13 has had water present for sample collection intermittently (first quarter 2004 and second quarter 2006). In the first quarter of 2004, VOCs were detected in Piezometer PZ-13 (1,1-DCA at 1.2 ug/L, MTBE at 5.2 ug/L, and six others at trace levels). In the second quarter 2006, inorganic sample results for Piezometer PZ-13 were lower than those in 2004, indicating that operation of the additional Landfill Gas (LFG) extraction wells along the northern boundary of Cell 2 has had a positive effect. Results of general parameters and lack of VOCs detected in the fourth quarter 2007 sampling of Suction Lysimeter VZ-2 indicate that water from Pan Lysimeter PL-1A has not impacted underlying water in the vicinity of this unsaturated zone monitoring point.

In the first quarter 2006, water was detected for the first time in pan lysimeter PL-1B on the south side of Landfill Cell 1B. Initial monitoring results included elevated concentrations of EC, TDS, and bicarbonate alkalinity, and VOC concentrations above the reporting limit. Based on these results, a recommendation to transfer Pan Lysimeter PL-1B to the corrective action monitoring program was made.

In 2006, the Discharger investigated the source of the liquid in Pan Lysimeter PL-1B and based on observations of the pipe boot and liner termination concluded that the pipe boot might not have been completely sealed. Additional sealing of the exposed area was completed, and a layer of bentonite was placed around the pipe boot. Concentrations of most organic constituents in Pan Lysimeter PL-1B have decreased (chloride, sulfate, and TDS) since the first quarter 2006, though bicarbonate remains elevated. The number and concentrations of VOCs detected in the fourth quarter of 2007 are lower than past quarters.

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A release of VOCs has occurred from Landfill Cell 2A. In April 2001, liquid containing VOCs at concentrations up to 20 µg/L was detected in Pan Lysimeter PL-2A which is located beneath Sump 2A on the north side of Cell 2A. In August 2001, the Discharger began implementation of an EMP to evaluate the possible sources of liquids and VOCs detected in Pan Lysimeter PL-2A. To evaluate the potential source of liquids in PL-2A, two piezometers (PZ-11 and PZ-12) were installed along the north side of Cell 2 and liquid levels in PL-2A and Sump 2A were evaluated. Both piezometers were screened in a sand and gravel layer from approximately 10 to 20 feet bgs. To evaluate the potential source of VOCs in PL-2A, two soil probes were advanced approximately 25 to 30 feet north of Cell 2 and soil gas samples were obtained from depths of approximately 10 feet bgs.

Data collected as a part of the EMP and from investigations conducted for the EFS show the presence of VOCs in soil gas in shallow soils approximately 25 to 30 feet north of landfill Cell 2. In addition, VOCs have been detected in liquids from Piezometer PZ-11. In November 2001, Regional Board Staff requested a revised EFS which incorporates the necessary gas control measures and describes the proposed installation of dedicated sump pumps with automated fluid level switches in Sumps 1A and 2A and transducers in pan lysimeters PL-1A and PL-2A. The Discharger submitted a workplan for interim LFG control measures to control the source of LFG impacting the vadose zone. An amended version to the workplan was approved on 5 June 2002. The interim measures were designed to reduce LFG pressure and gas-phase concentrations of VOCs in the leachate collection and removal layer at the bottom of the landfill cells by connecting a LFG extraction system to sump risers and cleanout pipes in Cells 1 and 2.

Interim LFG control measures commenced on 30 October 2002. Additional LFG measures were implemented in 2006 and 2007 in accordance with New Source Performance Standards (NSPS) as required by the Feather River Air Quality Management District. Operation of the LFG collection system is a required corrective action measure to reduce gas-phase concentrations of VOCs that have been detected in the unsaturated zone. LFG is extracted from the LCRS through the sump risers, the geonet drainage layer, and thirteen in-waste LFG extraction wells in Cells 1 and 2. The extracted LFG is currently flared; however, a LFG-to-energy facility is currently under construction at the facility. To evaluate the effectiveness of the gas control system, gas samples are obtained from the designated extraction and corrective action monitoring points at least quarterly and monitored for methane, carbon dioxide and oxygen. Additional gas extraction and control systems will be installed in future cells as the landfill expands as required by NSPS.

Corrective action measures for the releases from Landfill Cells 1A and 2A consist of implementation of LFG control measures described in Finding No. 42 and an automated leachate extraction system in Sumps 1A and 2A. Pressure transducers have been installed in underlying Pan Lysimeters PL-1A and PL-2A allowing for automated measurements of liquid levels above the base of the pan lysimeters. A *Corrective Action Assessment Report*, which presented an assessment of the interim corrective action measures was submitted on 24 May 2004. Improvements to the LFG control system have been made to increase the system's collection capacity. A total of thirteen in waste extraction wells (EW-1 through EW-13), two perimeter extraction wells (PEW-1 and PEW-2), and two additional LCRS risers (Sumps 1B and 2B) have been installed and tied into the LFG extraction system.

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Expansion of the gas control system will continue as the site is developed. Water monitoring results collected in 2007 indicate that operation of the existing LFG control system has reduced the overall number and concentration of VOCs detected in shallow groundwater, the unsaturated zone, and has resulted in a reduction in some of the VOCs in the leachate.

The Monitoring and Reporting Program describes the corrective action monitoring that is required to demonstrate the effectiveness of the corrective action measures per Title 27 CCR, Section 20430, as well as concurrent detection monitoring to provide the best assurance of the detection of potential subsequent releases per Title 27 CCR, Section 20385(c) and Section 20420. The Discharger must demonstrate that the facility complies with its Water Quality Protection Standard, including any applicable concentration limits greater than background, before the facility can cease corrective action monitoring and return to facility-wide detection monitoring.

Leachate and Condensate Management

As part of the amended RWD/JTD submitted on 8 August 2008, the Discharger requested to be allowed to return leachate and landfill gas condensate to the units from which they came to reduce leachate and condensate management costs. These units are Cells 1 through 9. Title 27 CCR 20340(g) requires that leachate be returned to the unit from which it came or be discharged in a manner approved by the Regional Water Board. This section also references State Water Board Resolution No. 93-62 regarding liquids restrictions in 40CFR 258.28 for MSW landfills. 40CFR 258.28 states that liquid waste may not be placed in MSW landfill units unless the waste is leachate or gas condensate derived from the landfill unit and it is designed with a composite liner and leachate collection system. Therefore, leachate and landfill gas condensate from composite lined units at the landfill may be returned to the unit from which they came. This Order includes requirements for returning leachate and landfill gas condensate back to the units such that it is not exposed to surface water runoff, will not cause instability of the landfill, and will not seep from the edges of the units.

Surface Water Drainage

Within the landfill footprint, surface water runoff is controlled by down-drains and drainage ditches flowing to the sediment basins. The sediment basins are located on the southwest side and northeast side of the landfill of the landfill respectively. Settled water is pumped (when necessary) from the basins to drainage channels that drain towards Best Slough, which borders the southern end of the landfill property. Best slough runs along the southern boundary of the site and discharges to the Feather River approximately 10 miles to the west.